UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,343	06/21/2005	Ryoichi Saitoh	14875-133US1	6719

26161 7590 05/16/2007
FISH & RICHARDSON PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
DANG, IAN D	
ART UNIT	PAPER NUMBER
1647	

MAIL DATE	DELIVERY MODE
05/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/509,343	SAITOH ET AL.	
	Examiner	Art Unit	
	Ian Dang	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) *12-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☒ Claim(s) *3 and 4* is/are objected to.

8)☒ Claim(s) *1-24* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/02/2004, 12/13/2004, 03/09/2005, 07/21/2005, 09/27/2006, 04/30/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-11, with traverse in the communication filed on 03/05/2006 is acknowledged.

The traversal is on the ground that Hsu et al. utilized an adenovirus that does not possess an envelope on which the transporter could have been expressed. It is well known that adenoviruses are non-enveloped viruses and so do not possess an envelope on which the transporter could have been expressed. In addition, Applicant argues that the Examiner has not asserted that any of the independent claims would have been obvious over the disclosures of this reference.

Applicant's arguments have been fully considered but are not found persuasive. While Hsu et al partially meets the limitations of claim 1, several prior art references meet the limitations disclosed in claim 1. For instance, Garcia et al. (1995, The Journal Biological Chemistry, Volume 270, Number 4, pages 1843-1849) teach a method of expressing the monocarboxylate transporter having monocarboxylate transporter activity, wherein the method comprises culturing the Sf9 host cells infected with the budding baculovirus virus (see page 1844, left column, 4th paragraph and Figure 3 page 1846). Thus Group I lacks novelty or inventive steps and does not make a contribution over prior art. Since the first claimed invention has no special technical feature, it cannot share a special technical feature with the other claimed invention.

Under PCT Rule 13.1, the application shall be related to one invention or to a group of inventions so linked as to form a single general concept.

Claims 12-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as

being drawn to a nonelected invention, there being no allowable generic or linking claim.

Applicant timely traversed the restriction (election) requirement in the reply filed 03/05/2007.

Status of Application, Amendments and/or Claims

The amendment of 05 March 2007 has been entered in full. Claims 4, 9, 10, 12, and 18-22 have been amended.

Claims 1-11 are pending and under examination.

Specification

The disclosure is objected to because of the following informalities:

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Appropriate correction is required.

Claim Objections

Claims 5 and 11 objected to because of the following informalities:

Claims 5 and 11 use acronyms without first defining what they represent in the independent claims (see for example, "PepT1", "PepT2", etc.). While the claims can reference acronyms, the material presented by the acronym must be clearly set forth at the first use of the acronym.

Appropriate correction is required.

Claim Rejections - 35 USC § 112 (Written Description)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 is drawn to a transporter having transporter activity, a recombinant virus, a gene encoding the transporter, and a budding virus. Claims 3 and 4 are drawn to a transporter of non-viral origin. Claims 4 and 10 are drawn to peptide transporter or an organic anion transporter. Claims 5 and 11 are drawn to analogues, fragments and mutants of PepT, PepT2, and OATPC (page 21, line 26-35).

Thus, the claims are genus claims. The specification and claims do not indicate what distinguishing attributes are shared by the members of the genus. Specifically, the specification does not clearly define a transporter having transporter activity, a recombinant virus, a gene encoding the transporter, a budding virus, a transporter of non-viral origin, a peptide transporter, and organic anion transporter analogues, fragments and mutants of PepT, PepT2, and OATPC and all methods of using such.

Thus, the scope of the claims includes numerous structural and functional variants, and the genus' are highly variant because a significant number of structural and functional differences between genus members is permitted. The specification and claims do not provide

any guidance as to what changes should be made. Structural and functional features that could distinguish a transporter having transporter activity, a recombinant virus, a gene encoding the transporter, a budding virus, a transporter of non-viral origin, a peptide transporter, and organic anion transporter analogues, fragments and mutants of PepT, PepT2, and OATPC are missing from the disclosure. No common attributes identify the members of the genus. The general knowledge and level of skill in the art do not supplement the omitted description because specific, not general, guidance is what is needed. Since the disclosure fails to describe the common attributes or characteristics that identify members of the genus, and because the genus is highly variant, a transporter having transporter activity, a recombinant virus, a gene encoding the transporter, a budding virus, a transporter of non-viral origin, a peptide transporter, and organic anion transporter analogues, fragments and mutants of PepT, PepT2, and OATPC are insufficient to describe the genus.

The written description requirement for a claimed genus' may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant identifying characteristics, i.e. structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between structure and function structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. In the instant case, the specification fails to provide sufficient descriptive information, such as definitive structural or functional features of the genus for a transporter having transporter activity, a recombinant virus, a gene encoding the transporter, a budding virus, a transporter of non-viral origin, a peptide transporter, and organic anion transporter analogues, fragments and mutants of PepT, PepT2, and OATPC and all methods of using such.

There is no description of the special features, which are critical to the structure and function of the genus claimed. Furthermore, the prior art does not provide compensatory structural or correlative teachings sufficient to enable one of skill to isolate and identify a transporter having transporter activity, a recombinant virus, a gene encoding the transporter, a budding virus, a transporter of non-viral origin, a peptide transporter, and organic anion transporter analogues, fragments and mutants of PepT, PepT2, and OATPC encompassed by the limitations. Thus, no identifying characteristics or properties of the instant a transporter having transporter activity, a recombinant virus, a gene encoding the transporter, a budding virus, a transporter of non-viral origin, a peptide transporter, and organic anion transporter analogues, fragments and mutants of PepT, PepT2, and OATPC are provided such that one of skill would be able to predictably identify the encompassed variant biological and chemical entities recited in the methods of the instant claims. One of skill in the art would reasonably conclude that the disclosure fails to provide a representative number of species to describe the genus. Thus, applicant was not in possession of the claimed genus.

Claim Rejections - 35 USC § 112 (Enablement)

Claims 1-11 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for (1) expressing wild type and his tag added PepT1 and PeptT2, (2) wild type and mutant N130D, V147S OATP-C in baculovirus (3) inhibiting PepT1 activity expressing viruses by anti-human PepT1 monoclonal antibody does not reasonably provide enablement *for* a method for expressing a transporter having transporter activity, wherein the method comprises culturing a host infected with a recombinant virus that comprises a gene encoding the transporter, and expressing the transporter on the envelope of a budding

virus released from the host. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make/use the invention commensurate in scope with these claims.

In In re Wands, 8USPQ2d, 1400 (CAFC 1988) page 1404, the factors to be considered in determining whether a disclosure would require undue experimentation include: (1) Nature of the invention, (2) the state of the prior art, (3) the predictability or lack thereof in the art, (4) the amount of direction or guidance present, (5) the presence or absence of working examples, (6) the breath of the claims, (7) the quantity of experimentation needed, (8) relative skill of those in the art.

Nature of the invention and breath of the claims

The invention is drawn to a method for expressing a transporter having transporter activity, wherein the method comprises culturing a host infected with a recombinant virus that comprises a gene encoding the transporter, and expressing the transporter on the envelope of a budding virus released from the host. The invention is broad because the recitation of claim 1, encompasses a large number of transporter genes, viruses, transporters, and transporter activities.

Unpredictability and state of the art

The state of the art for a method expressing certain membrane receptors, such beta 2 adrenergic receptors and K channels with baculovirus are well established, but a method for expressing any transporter having any transporter activities is not well characterized. The method for each individual transporter must be specifically optimized for that transporter

because in some instances the expressed transporter may not have any activities. For instance, Loisel et al. (1997, Nature Biotechnology, Volume 15, pages 1300-1304, cited in the IDS mailed March 09, 2005 as reference BF) recite that the baculovirus/insect cell system offers the advantage of usually high levels of expression of proteins. But a major caveat of the insect cell system is the expression of an important proportion of inactive receptors. As a consequence, receptor purification schemes that do not include a step based on the biological activity of the receptor, such as ligand affinity chromatography, yield heterogeneous preparations contaminated with nonfunctional and possibly misfolded receptors, which may bias physicochemical and structural studies (page 1300, left column, 1st column).

In view of these teachings in the art and the limited guidance provided in the specification, the method for expressing wild type and his tag added PepT1 and PeptT2, (2) wild type and mutant N130D, V147S OATP-C in baculovirus (3) inhibiting PepT1 activity expressing viruses by anti-human PepT1 monoclonal antibody is not predictable for a method for expressing a transporter activity, wherein the method comprises culturing a host infected with a recombinant virus that comprises a gene encoding the transporter, and expressing the transporter on the envelope of a budding virus released from the host.

The amount of direction or guidance present

Applicants' disclosure is limited to expressing wild type and his tag added PepT1 and PeptT2 with baculovirus (Figures 1-2), (2) wild type and mutant N130D, V147S OATP-C with a baculovirus (Figure 3), (3) inhibiting PepT1 activity expressing viruses by anti-human PepT1 monoclonal antibody (Figure 4). However, the specification does not provide guidance or direction regarding a method for expressing other transporters, such as the ones listed in Table

1 (pages 6-9) or Table 2 (pages 23-28), other virus besides baculovirus, or other OATP-C mutants besides the N130D and V147S.

Working Examples

Although Applicants have provided examples for (1) expressing wild type and his tag added PepT1 and PeptT2 with baculovirus (Figures 1-2), (2) wild type and mutant N130D, V147S OATP-C with a baculovirus (Figure 3), (3) inhibiting PepT1 activity expressing viruses by anti-human PepT1 monoclonal antibody (Figure 4), the specification does not provide any methods or working examples a method for expressing other transporters, such as the ones listed in Table 1 (pages 6-9) or Table 2 (pages 23-28).

The quantity of experimentation needed

Without sufficient disclosure in the specification, it would require undue experimentation for one of skill in the art to express a transporter having transporter activity, wherein the method comprises culturing a host infected with a recombinant virus that comprises a gene encoding the transporter, and expressing the transporter on the envelope of a budding virus released from the host. In addition, it would require undue experimentation to practice the invention commensurate in scope with the claims because, the claims are broadly drawn to a method for expressing a transporter having transporter activity, wherein the method comprises culturing a host infected with a recombinant virus that comprises a gene encoding the transporter, and expressing the transporter on the envelope of a budding virus released from the host. Undue experimentation would also be required of the skilled artisan to identify a transporter activity and generate the infinite number of transporter analogs and derivatives recited in the claims and screen same for activity.

Claim Rejections - 35 USC § 112 (Second Paragraph)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "culturing a host" in claim 1 is a relative term which renders the claims indefinite. The phrase "culturing a host" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is not clear what elements or steps are encompassed by this term.

The phrase "transporter activity" in claims 1 and 6 is a relative term which renders the claims indefinite. The phrase "transporter activity" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is not clear what element is encompassed by this term.

The metes and bounds of the claims cannot be determined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyasaka et al. (2001, Protein Expression and Purification, Volume 23, pages 389-397).

The claims are drawn to a method for expressing a transporter having transporter activity, wherein the method comprises culturing a host infected cell with a recombinant virus that comprises a gene encoding the transporter, expressing the transporter on the envelope of a budding virus released from the host. Furthermore, the claims are further drawn to a virus that expresses a transporter having transporter activity. The virus is a baculovirus and the transporter is derived from a non-virus. The transporter is a peptide transporter or an organic anion transporter

Miyasaka et al. teach a method of expressing the peptide taurine transporter wherein the method comprises culturing Sf9 cells with the recombinant virus baculovirus that comprises the taurine transporter gene and expressing the transporter of a budding virus released from the cell (page 389, abstract) meeting the limitations of claims 1, 2, 8, and 9. It is noted that the budding is an inherent property of the baculovirus.

The mammal taurine transporter is derived from a non-virus and is a peptide transporter encompassing the limitations of claims 3, 4, 7, and 10, . Moreover, Miyasaka et al. teach that the virus has taurine transporter activity (figure 3 page 392) meeting the limitations claim 6.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka et al., (2001, protein expression volume 23, pages 389-397) as applied to claims 1-4 and 6-10 above, and further in view of Hsu et al., (1998, Pharmaceutical Research, Volume 15, Issue 9, page 1376-1380).

The teachings of Miyasaka et al. (2001, protein expression volume 23, pages 389-397) are set forth above. However, the reference does not teach the transporter PepT1, PepT2, or OATPC-C of the instant claims.

Hsu et al teach the method of the expression of the oligotransporter PeptT1 using PeptT1 using an adenoviral vector.

Thus, it would be obvious for one skilled in the art to modify the method for expressing a transporter having transporter activity, wherein the method comprises culturing a host infected cell with a recombinant virus that comprises a gene encoding the transporter, expressing the transporter on the envelope of a budding virus released from the host as taught by Miyasaka et al. (2001, protein expression volume 23, pages 389-397) by using the transporter, PepT1, as

taught by Hsu et al. (1996). One of ordinary skill in the art at the time the invention was made would been motivated to express Pept1 in baculovirus because gene delivery using a variety of viral and synthetic vectors provides a novel strategy for treating diseases and delivery of therapeutic proteins (Hsu et al., page 1376, right column, 2nd paragraph). One skilled in the art would have expected success because the PepT1 gene has been expressed successfully in a viral vector and numerous other membrane transporters have already been expressed in Sf9 cells using the baculovirus system at the time the invention was made. Accordingly, the invention taken as a whole is prima facie obvious.

Conclusion

No claim is allowed.

Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian Dang whose telephone number is (571) 272-5014. The examiner can normally be reached on Monday-Friday from 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Nickol can be reached on (571) 272-0835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ian Dang
Patent Examiner
Art Unit 1647
May 7, 2007

Bridget E. Bunner

BRIDGET BUNNER
PATENT EXAMINER